GOSAFE

SYSTEM

G787 Tracking Device

User Manual

Version 2.01

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Version specification

This document was made based on the G787 products, after this version was fixed. If there is any need to change, such as increased command or modify command etc, must be agreed by scriptures control center. After Revised, the version will need upgrade,

Date	Version	Modification	Basic Version	Hardware Version
2011.04.27	V1.01	First Published	V1.01	V1.01
2011.05.16	V2.01	1. Upload mode add to "S" mode （UUM/SSM/TPM/UPM command） 2. Server port default：3032 （SIP command） 3. Server address domain default: empty (SDM command)	V2.10	V1.01

1. Device Introduction

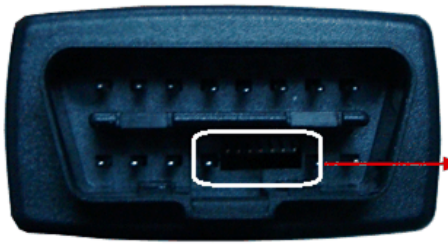
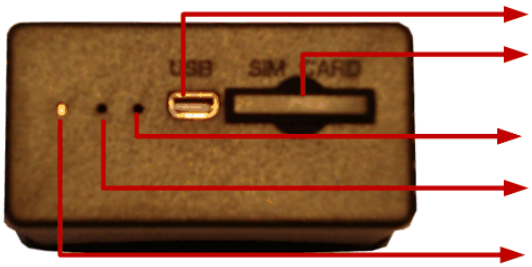
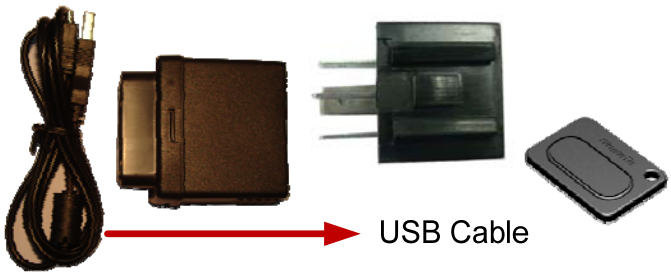
G787, which uses GSM SMS together with GPS to locate your belongings, is a new model tracking device designed by Gosafe Company Limited. Connect & Go concept, G787 can connect with OBDII diagnostic port and can get necessary power from the same port.

Inside G787, there are GSM modem, GPS receiver, control PCBA, microprocessor, power circuit, and so on. Before starting G787 installation, please one SIM card which works based on GSM network that is offered by GSM mobile operating agency and can work with GPRS.

G787 is easy to install device even nonprofessionals can install this device. You only need to get the valid data SIM Card. Insert the SIM card in the G787 and connect he device to the OBDII port in the vehicle. The system have internal movement sensor which controls the power management of the device.

G787 is equipped with highest available GPS uBlox modules and able to use A-GPS (Assist GPS) technology to give help connecting the device with GPS faster with more accuracy.

1.1 Physical Appearance

Description	Pictures
Device	
Front View	
Rear View	
Wireless Relay	
Complete Set with USB Cable	

2. Specification

Physical Specification	**Size**	55 x 50 x 25 mm
	Weight	80 g
	IP Rating	IP62
Power	**Rechargeable Battery**	7.4V 180mAh Lithium ION
	Power Consumption	Sleep mode < 20uA
		Power Save mode < 5mA
		Max. Performance < 300mA
MCU	**MCU**	TI MSP430 12KB RAM, 256KB Flash
GSM	**Antenna**	Internal
	Modem	uBlox LEON 100
	Frequency	Quad band 850/900/1800/1900MHz
	GPRS	Class 10 (4 downlink, 2 uplink, max. 5) Mobile Station Class B
	Approvals	AT&T, R&TTE, CE, GCF, FCC, PTCRB, Anatel, IC, China SRRC, etc
	SIM card	3.3V SIM
	LBS Location Accuracy	100 to 500meters(Urban)
		0.5 to 30kilometers(Suburb)
GPS	**Antenna**	Internal
	Receiver	uBlox NEO 6M (GPS, & Sbase) engine
	Channels	50 Parallel Channels
	Sensitivity	-162dBm
	Navigation update	1sec
	Acquisition	Cold Starts: 27s Aided Starts: <1s Hot Starts: <1s
	Location Accuracy	2.5 to 10meters (Strong Signals)
		500 meters (Weak Signals)
Sensor	**3D G-Force Sensor**	Onboard
Memory	**Flash**	10,000 Locations
Environmental Conditions	**Operating Temperature**	-40℃ to +70℃
	Storing Temperature	-40℃ to +85℃
	Humidity	95%

3. Features

Real Time Location
Mobile Map Location
Latitude and Longitude Location
GSM Base Station Location（LBS Technology）
Convenient GSM Mobile Control
Smart Stop (Wireless Immobilizer)
Easy-to-use SMS Communication Mode
Internal Movement Sensor for better power management
Internal backup battery for Device disconnection notification
Internal memory for the data buffer

4. Quick Install Instructions

4.1 Configuration

The G787 is supplied with USB cable. Connect the USB cable to the device and connect it with the computer. The computer may require USB driver. It can automatically update the USB driver if not then please download the USB driver from http://www.gosafesystem.com/downloads.asp and then click on the G787 USB driver.

After downloading the USB driver update the USB driver and establish the connection between G787 and your computer.

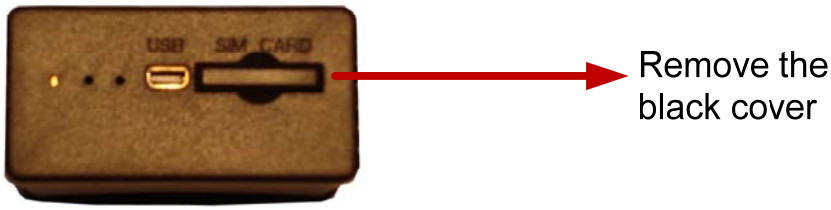
Use the configuration software to configure:

4.2 Insert SIM card

The user must arrange a SIM card with valid data plan. Before inserting the SIM card it must be tested with your own mobile.

Insert the SIM card in your own mobile and try to send out SMS and receive SMS if it works fine then try to connect to internet by opening any website in mobile browser.

Now you can remove the black cover from the G787 SIM card jack hole.



After removing the black cover you can insert the SIM card in the jack. Please note the following pictures for the direction of the SIM card.

Press the SIM card inside the SIM card jack completely.

Note: Please do activate the SIM card, disable its PIN code function, and make sure SIM card has enough balance before operating the device.

Each time before taking SIM card out of or inserting SIM card into the device, device power supply remove the device from the OBDII connector, or it would damage device and/or your SIM card.

4.3 Locating OBDII Port

Normally ODBII port is available in all the vehicles manufactured after the 1996 and 2000. This port is located under the dash near the driving side of the vehicle. Normally this port is covered with some cover.

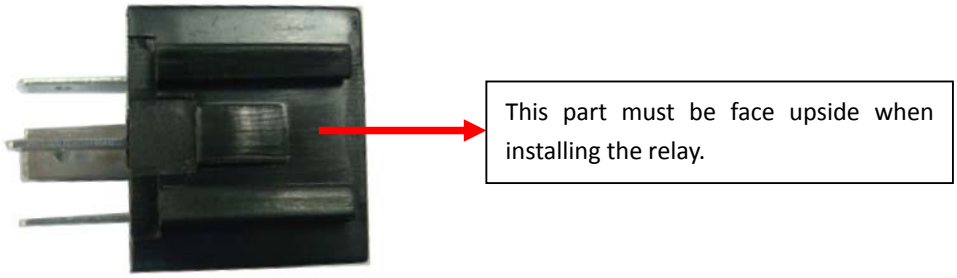
Some common images of OBDII port location.

4.4 Connecting G787

Remove the cover on the OBDII port and connect the G787 to the same port as shown in blow picture.

4.5 Installation of wireless relay

The units contain one wireless relay. This relay can be installed using the relay socket in the same way as other relays installed for the immobilization. The only thing which needs to be careful when installing the relay is the direction of the relay. The relay must be installed same as the following picture.



4.6 Set User No.

To set user No., you can use any mobile phone to send the following SMS command to the SIM card No.:

1234,UNO;+8613912345678

or

1234,UNO;13912345678

Explanations:

+8613912345678: user No. with country code

13912345678: user No. without country code

UNO: Command Control Word

After receipt of the above SMS command, device will reply a confirmation SMS and work at default work mode: 30M;G;W

To protect device, if there is any error in this command, device will not send back any error warning.

4.7 Modify Password

To modify factory password at the first usage is strongly suggested. Password should be 4 digits that picked from 0-9. To modify password, you can use user No. send the following SMS command to the SIM card No.:

1234,UPW;5678

Explanations:

1234: Factory Password

5678: New Password

Note: Please memorize your New Password and wait for confirmation SMS for password modification from device.

Only if this command is sent by user No., the system can process this command.

4.8 Set Work Mode

There are 4 different work modes configurable for device according to user's need: O, S, G, and L. Detailed information on 4 work modes, please go to "Commands for Device Setting" in this User Manual.

Example:

To set device in G Work Mode, you should send the following SMS command to the SIM card No.:

****,UUM;30M;G;T

Explanation:

****: password

UUM: Command Control Word

G: the Work Mode user wants to configure

T: the type of message

5. Commands for Device Setting

All the commands for device setting in this User Manuel are in the same format:
user password+ command content

The command content is restricted to digits (0-9), English characters (a-z, and/or A-Z) and/or common punctuations (Please check "Characters for Commands" table in Appendix), beyond which device cannot recognize. If there is any character device cannot recognize, device will ignore it and will not give any related warning to user.
All English control words in command could be capital words or lower case words.

5.1 Set User No.

Command Format:

****	,	UNO	;	xxxxxxxxxx
****	,	UNO	;	+yyxxxxxxxxxx

Explanations:
****: user password (4-digit)
, : command delimiter
UNO: command control word
; : command delimiter
xxxxxxxxxx--------telephone No. without country code
+yyxxxxxxxxxx--------telephone No. with country code("+" is country code mark while "yy" is country code
You can send SMS command to set or modify user No. through any mobile phone number. No matter the telephone No. in command with or without country code, it is acceptable. Device will reply a message for confirmation on after receipt of setting command to the set mobile phone, from which the setting command was sent.
Example:
Setting command without country code in telephone No.:1234,UNO;13912345678
Setting command with country code in telephone No.:1234,UNO;+8613912345678
Reply:
G787 V0.12
UNO:13912345678
Or
G787 V0.12
UNO:+8613912345678

5.2 Modify User Password

Command Format:

****	,	UPW	;	xxxx

Explanations:
****: user old password (4-digit)

, : command delimiter
UPW: Command Control Word
; : command delimiter
xxxx: user new password(4-digit)
Only if this command is sent by user No., the system can process this command. After password modification successful, please do memorize your new password.
Example：1234,UPW;5678
Reply:
G787 V0.12
UPW:5678

5.3 Set Upload Mode, interval and type

Command Format:

****	,	UUM	;	xxS	;	G	;	T

Explanations:
****: user password (4-digit)
, : command delimiter
UUM: Command Control Word
; : command delimiter
xx: SMS interval
S: command control word (interval in Second, Minute, Hours)
;: command delimiter
G: Command Control Word (Mode)
;: command delimiter
T: Type of upload (Text, with hyperlink)

After receipt of this command, device will reply you a piece of message in UUM: 30M:G:T SMS Format. At each wakeup, device would send you a location report message in this format.
If device is in positive real-time work mode(upload operating cycle 00S or 00M or 00H), only one piece of location report message will be sent by device; if updated location report is in demand thereafter, please send another command then device will response accordingly.
Operating Cycle:
xxxS: Seconds upload range (30 ~ 900 seconds)
xxxM: Minute upload range (15 ~ 59 minutes)
xxxH: Hour upload range (1 ~ 240 hours)

Work Modes:
O: Cancel Upload
G: GPS based location
S: Always update with GSM base station (LBS)
L: Device calls back after set interval of time for voice monitoring.

Message Types:

T: Text format (SMS)

W: Text format with hyperlink (SMS with hyperlink)

Example： 1234,UUM;30S;G;T

Reply:

G787 V0.12

UUM:30S:G:T

5.4 Set Message Center Number

Command format

****	,	SCN	;	+XXXYYYYYYYYYYYY

Explanations:

****: user password (4-digit)

, : command delimiter

SCN: Command Control Word

; : command delimiter

+XXXYYYYYYYYYY: Message center number (XXX= country code, YYYYYYYYYYY = center number)

After receipt of this command the device will reply with message SCN:+XXXYYYYYYYY.

Example：

1234,SCN;+8613800200500

Replay:

G787 V0.12

SCN:+8613800200500

5.5 Set APN

Command format

****	,	APN	;	CMNET	;	internet	;	internet

Explanations:

****: user password (4-digit)

, : command delimiter

APN: Command Control Word

; : command delimiter

CMNET: Access Point Name (Confirm Access Point Name from the service provider)

;: command delimiter

internet: APN user name

;: command delimiter

Internet: APN Password

After receipt of this command the device will reply with message APN:access point name:APN user name:APN password, the device will connects with GPRS after receiving this command.

The G787 is equipped with many APN (Access Point Name) from many countries. If device automatically connects with GPRS then user no need to send above command. If the device doesn't connect with GPRS then user may need to use APN command.

Example:

APN: cmnet, APN user name: internet, APN password: internet, command is:

1234,APN;cmnet;internet;internet

Reply:

G787 V0.12

APN:cmnet;internet;internet

If you only set the APN without the username and password

Example

APN:cmnet, APN username: empty, APN password: empty, command is: 1234,APN;cmnet

Reply:

G787 V0.12

APN:cmnet;;

5.6 Enable/Disable Over speed alarm

Command format

********	**,**	**SPO**	**;**	**M**

Explanations:

****: user password (4-digit)

, : command delimiter

SPO: Command Control Word

; : command delimiter

M: Parameter (1=Enable, 0=Disable)

After receipt of this command the device will reply with message SPO:M, device would enable/disable over speed alarms. If enable the device will send SMS to user mobile according to the setting of over speed limit. If disable it will not detect the over speed limit.

Example:

Enable over speed alarm, command is: 1234,SPO;1

Disable over speed alarm, command is: 1234,SPO;0

Reply:

G787 V0.12

SPO:1

Or

G787 V0.12

SPO:0

5.7 Enable/Disable Over Speed Alarm Parameter

Command format

****	,	SOP	;	Alert Speed	;	Alarm Speed

Explanations:

****: user password (4-digit)

, : command delimiter

SOP: Command Control Word

; : command delimiter

Alert Speed: set the speed in KM/H (80 km/h)

; : command delimiter

Alarm Speed: set the speed in KM/H (100 km/h)

After receipt of this command the device will reply with message SOP:Alert speed; alarm speed, The Alert speed is the speed when the system start testing the over speed and send the alert first. If the device crossed the alarm speed limit it will send the alarm.

Example：

Alert speed = 80

Alarm speed=100

Command

1234,SOP;80;100

Reply:

G787 V0.12

SOP:80;100

5.8 Enable/Disable SMS when movement trigger

Command format

****	,	MOT	;	M

Explanations:

****: user password (4-digit)

, : command delimiter

MOT: Command Control Word

; : command delimiter

M: Parameter (1=Enable, 0=Disable)

After receipt of this command the device will reply with message MOT:M, device would enable/disable the SMS to user mobile when movement is sensed by movement sensor.

Note: The device will automatically send location SMS to the user once it will sense any movement. The device will send only one SMS at the start of the movement. Device will wait for the vehicle to stop and will start the counter to 60 min. If the movement is after 60 min. device will again send the SMS to the user mobile.

Example:

Enable SMS upload when movement trigger, command is: 1234,MOT;1

Disable SMS upload when movement trigger, command is: 1234,MOT;0

5.9 Set Voice Monitoring Number

Command format

****	,	VOM	;	+YYXXXXXXXXXXX

Explanations:

****: user password (4-digit)

, : command delimiter

VOM: Command Control Word

; : command delimiter

+YYXXXXXXXXXX--------telephone No. with country code("+" is country code mark while "YY" is country code

After receipt of this command the device will call back to the number mentioned in the command +YYXXXXXXXXXX. The user can listen inside the vehicle but the driver will never know this activity.

Example:

1234,VOM;+86123456789

Reply:

G787 V0.12

VOM:123456789

5.10Location Poll

There are two ways to poll the location from the device.

1. By sending PQR SMS to device:

****	,	PRQ

****: user password (4-digit)

, : command delimiter

PRQ: Command Control Word

Example:

1234,PRQ

Reply:

G787 V0.17

PRQ

The device will send back the location information after getting the latest GPS data.

G787 V0.17

GPS 5/67
UTC 11-05-11 06:47
N23.164367
E113.428548
SPD:0km/h
TMP:37.8C
PWR:10.5V

2. The user mobile can call to the device number and hangup after first ring. The device will send back the GPS location to the user mobile.

G787 V0.17
GPS 5/67
UTC 11-05-11 06:47
N23.164367
E113.428548
SPD:0km/h
TMP:37.8C
PWR:10.5V

5.11Set Time Zone

Command format

****	,	TZN	;	Time Zone

Explanations:

****: user password (4-digit)
, : command delimiter
TZN: Command Control Word
; : command delimiter
Time Zone: Enter the time zone parameters -12:00 to 12:00

After receipt of this command the device will send back TZN:Time zone. After receiving this command the device will send the local time in the SMS if the gps data is valid. If there is not GPS data device will not send the time.

Example：

Time zone= +8
1234,TZN;8:00

Reply:

G787 V0.12
TZN:8:00

Time Zone= -5

1234,TZN;-5:00

Reply:

TZN:-5:00

5.12 Immobilizer Command

Command format

****	,	IMM	;	M

Explanations:

****: user password (4 digit)

,: command delimiter

IMM: Command Control Word

;: Command delimiter

M: Command Parameter (Values are M=0 Release Immobilizer, M=1 Immobilize vehicle)

After receipt of this command the device will send back the IMM:0 or 1. After receiving the command device will act accordingly and immobilize or release immobilize of vehicle.

Note: Once the device is disconnected from the OBDII port and it stays out of 5-10 Meter range the device relay will automatically immobilize the vehicle. The device is equipped with internal backup battery which means it can supply the power for 5-10 Min. to the device and the device can send back the alarm “Power Off”. Once the device is completely power off the relay will immobilize the vehicle even the G787 stays inside the vehicle.

Gosafe provide especial 2.4Ghz RFID tags with the G787. If the vehicle needs to go for service and device need to remove from the OBDII port the 2.4Ghz tag must stay inside in order to start the car.

5.13 Clear Alarm

Command format

****	,	UAC

Explanations:

****: user password (4-digit)

, : command delimiter

UAC: Command Control Word

After receipt of this command the device will send back UAC. It will clear the user alarm and device will not send the user alarm.

Example：

1234,UAC

Reply:

G787 V0.12

UAC

5.14 Commands Wait

In the event of there come commands from user when device is in sleep and couldn't process commands, at each wakeup device will wait one minute to receive those commands and take precedence to process them then response one confirmation message; after 1 min, device would receive and process real-time commands then reply accordingly.

5.15 Alarms

The device sends alarm immediately it triggers. The message receive when device is in alarm as follows:

G787 V0.12
GPS 6/77
UTC 11-05-14 05:33:47
N23.164479
E113.428606
SPD:0km/h 0
Alarm:
Power Off

List of Alarms:

SMS Received	Description
G787 V0.12 GPS 6/77 UTC 11-05-14 05:33:47 N23.164479 E113.428606 SPD:0km/h 0 Alarm: Power Off	Power Off
G787 V0.12 GPS 6/77 UTC 11-05-14 05:33:47 N23.164479 E113.428606 SPD:0km/h 0 Alarm: Over Speed	Over Speed
G787 V0.12	Moving (When the vehicle I stopped and the movement

GPS 6/77 UTC 11-05-14 05:33:47 N23.164479 E113.428606 SPD:0km/h 0 Alarm: Moving	sensor is enable the device sends move alarm on the trigger of movement sensor)
G787 V0.12 GPS 6/77 UTC 11-05-14 05:33:47 N23.164479 E113.428606 SPD:0km/h 0 Alarm: Geo-Fence	Geo-Fence (Future use the current version firmware don't support it)
G787 V0.12 GPS 6/77 UTC 11-05-14 05:33:47 N23.164479 E113.428606 SPD:0km/h 0 Alarm: Anti-Jamming	Anti-Jamming (This alarm appear if the anti-jamming feature is enable and the someone use GSM jammer near the device)

Note: The user can use the UAC command to clear user based alarm.

5.16 Default Parameters

Device is set with the following default parameters. When device power up first time the device will use the following parameters to connect and wait for user commands or server commands.

Description	**Parameter**
User number	(EMPTY)
SMS center number	(EMPTY)
PIN code of SIM	1234
APN list	APN list of China only
User password	1234
User upload mode	30M;G;W
Manager phone number	(empty)
Manager upload mode	30M；G；T
Server IP or domain name	domain name (empty) IP (114.142.154.28)
TCP port	3032
UDP port	3032

TCP channel upload mode (mode 0)	60S；G；B
UDP channel upload mode (mode 0)	60S；G；B
Package number of per TCP upload	1
Package number of per UDP upload	1
percentage of data buffer per TPC upload	50
percentage of data buffer per UDP upload	50
Over speed	80；100
Enable/ disable over speed alarm	Disable
Enable/disable vibration sensor	Disable
Enable/disable phone roaming status test	Enable
Enable/disable anti-jamming	Disable
Time zone	0:00
Vibration sensor parameter	10；10；30
Anti-jamming parameter	30；20
Baud rate of extend serial port	9600
Transmit mode of extend serial port	Common mode
USB port mode	Common mode
Supper link (0) GPS Link	http://maps.google.com/staticmap?zoom=14&size=300x300&markers=%n,%e&sensor=false
Supper link (1) (LBS Link)	(empty)
Phone list of SMS forwarding	(empty)
Hot line list	(empty)
Time for talking	0；0
SMS number counter	0；0

5.17Combine Command

To save time and SMS resource on configuration, user can apply combine command, in which there is more than one command, to operate configuration. The combine command would begin with user password, which is followed by commands (commands order is flexible).

Format is as follow:

Password	,	Command word	;	Parameter	;	Parameter	,	Command word	;	parameter
		First command						Second Command		

If there is duplication of the same command in the same combine command, just the last piece of command would be processed; if there is error in the command, the command with error would be discarded, and device would only confirm setting of correct commands with no error warning. If all the commands are error, an alarm will be sent.

All setting commands, except user No. setting command under the condition of the user number

has never been changed, can be set by combine command.

Example： 1234,UUM;30M;G;T,UPW;1234

6. Structures of SMS from Device

6.1 Normal Location SMS Format (G Mode)

(Located Successful)

Gosafe G787 V0.10	Device Name and Version
GPS 3/56	Satellites Connected &Time used for Location (secs)
LTM08:00 11-24-10 02:54	Specific time zone and Location time based on specific time zone
N23 9.8329	Latitude in degree-minute format
E113 25.7149	Longitude in degree-minute format
Speed: 1km/h 39	Device speed and Move Direction
TMP=25.6C	Temperature
PWR=12.5	Power

(Located Unsuccessful)

Gosafe G787 V0.10	Device Name and Version
MCC=460	Mobile Country Code
MNC=1	Mobile Network Code
LAC=517A	Location Area Code
CID=1FB1	Cell Identity
TMP=25.6C	Temperature
PWR=12.5	Power

6.2 Hyperlink SMS Format (W Mode)

(Located Successful）Google link

Gosafe G787 V0.10	Device Name and Version
http://maps.google.com/staticmap?zoom=14 &size=150x150&markers=39.9493,116.3875 &sensor=false	Google Map Link
TMP=25.6C	Temperature
PWR=12.5	Power

(Located Successful）Yandex link

Gosafe G787 V0.10	Device Name and Version
http://m.maps.yandex.ru/?ll=116.3875,39. 949328&pt=116.3875,39.949328&z=12	Yandex Link
TMP=25.6C	Temperature
PWR=12.5	Power

(Located Unsuccessful)

Gosafe G787 V0.10	Device Name and Version
MCC=460	Mobile Country Code
MNC=1	Mobile Network Code
LAC=517A	Location Area Code
CID=1FB1	Cell Identity
TMP=25.6C	Temperature
PWR=12.5	Power

6.3 Error Command Alert

Gosafe G787 V0.10

Error command!

6.4 Password Modification Successful Confirmation

Gosafe G787 V0.10

UPW:5678

6.5 User No. Setting Successful Confirmation

Gosafe G787 V0.10

UNO:+8613912345678

6.6 Command Table

The user command is shown in table7. The whole command format is "PSW,CMDXX;Para" . Table 7 only show the second part "CMDXX;Para " in the column of "command format.

User Command List

Sr.	Description	Ctrl Word	Command	Replay	Remarks
1	Setting user phone number	UNO	①UNO;13912345678 or ②UNO;＋8613912345678	①UNO:13912345678 or ②UNO:＋8613912345678	0~20 bits, default is empty ①set national number ②set international number,"86"is country number
2	Setting user password	UPW	UPW;1234	UPW:1234	Four bits,range:0000~9999
3	Setting users to upload mode	UUM	UUM;30M;G;T	UUM: 30M;G;T	30M：upload interval, M can be (30~900S)、(15~59M)、(1~240H) Default:30m;G;W G： upload mode， it can be： "O"/close uploading "G"/ upload GPS data by interval set, when there is no GPS ,data uploading based on base station

					information “S”/ Always upload with LBS location “L”/monitoring, device call to the user by interval T:data format, it can be： T, //text W, // super link
4	User alarm cleared	UAC	UAC	UAC	
5	Requests location information	PRQ	PRQ	PRQ	Usage: send command to device, the device will upload information, Information format is the same as upload data by interval, and this function can also be done by calling to the device and hang up after first ring.
6	setting the SMS center number	SCN	SCN;+8613800200500	SCN:+8613800200500	Total is 20 bits”86”is national code, must have. Leave factory set: empty Default: usually, no need to set SMS center number, when user use SIM card, device will record SMS center number automatically ,when change SIM card the old number will be delete and record new one
7	set APN	APN	APN; APN; user name; password APN;APN	APN: APN; user name; password APN:APN	Parameter range “APN”:1~30 characters “user name”: 0~30 characters “password”: 0~30 characters The second command way” APN; APN” Means only set APN. Device comes with of some APN list of some mobile service providers for some country. when the APN information is included for the SIM card used ,no need to configure, if APN is wrong, GPRS connection will be wrong

8	Monitor	VOM	VOM;13912345678 or VOM;+8613912345678	VOM:13912345678 or VOM:+8613912345678	“86”is country code The number can’t be empty Usage: send command, the device will call back, open microphone, user start monitor
9	enable/disable over Speed	SPO	SPO;0	SPO:0	0：close 1：open Default:SPO;1
10	Speeding alarm parameters	SOP	SOP; 100;120	SOP:100;120	100：prompt 120：alarm Default :SPO;80;100
11	Motion sensor enable and disable	MOT	MOT;0	MOT:0	0：Close, shielding sensor related function IS cancelled, relevant information don't send. 1：open ,can Use related functions of movement sensor
12	Time zone setting	TZN	TZN;8：00	TZN:8：00	Set local time zone parameter from -12:00 to 12:00, Negative represent western time zone, positive represent east eastern time zone Default ：0：00
13	Immobilizer Output	IMM	IMM;0	IMM:0	"0" : close "1”: open device send power cut command or the device is disconnection, cut power of vehicle.

7. LED Flashes & Relevant Device Status

There is an external LED light to reflect device status in G787. In order to check device status through this LED light flashes, LED is located right next to the USB port.

When device is at work, LED will flash at 8-sec cycle constantly to show related GSM and GPS status in each cycle.

In each flash cycle when device is at work, LED will flash to indicate GSM status first then GPS status (there is an interval between them). To check the statuses, please count the LED light flashes then compare it to the chart below:

Status	**LED Flashes**
Device Power on	LED ON <1sec
GSM module ON but unregistered	1 flash at the beginning of each flash cycle
GSM module ON and registered	2 flashed at the beginning of each flash cycle
GSM module OFF	No flash at the beginning of each flash cycle
GSM module on and registered	3 flash then GPRS connection
GSM module on and registered	4 flash then TCP connection
GPS module ON but haven't located	1 flash after interval (behind GSM status flash) in each flash cycle
GPS module ON and located	2 flashes after interval (behind GSM status flash) in each flash cycle
GPS module OFF	No flash after interval (behind GSM status flash) in each flash cycle

Device also uses LED flashes to indicate relevant error if any of the following situations happens: Device Error, SIM card no balance, GSM network cannot register. When there is any error above, **LED light will ON 1sec then flash quickly**, which helps trouble shoot errors; user can count LED quick flashes then compare it to below chart:

Error Details	**LED Flashes**	**Solutions**
GSM module Communication Error	1 flash	Power OFF then check GSM module power supply and communication
SIM card Error	2 flashes	Power OFF then check whether SIM installation is good and PIN is disabled
Cannot register at GSM network	3 flashes	To check whether SIM card is overdue and/or device in an area there is no GSM signal
GPS module Error	4 flashes	Power OFF then check GPS module power supply and communication
SMS Sending Error	5 flashes	To check whether there is SIM card SMS center setting error and/or

		SIM card is overdue
Can't use GPRS	6 flashes	To check whether the APN is correct and SIM has GPRS function or not
TCP connection Error	7 flashes	To check if the server is normal
Unknown Error	8 flashes	Power OFF then Power ON, if there is still the error, please contacts us.

8. Appendix

8.1 Characters for Commands

0	1	2	3	4	5	6	7	8	9
A	b	c	d	e	f	g	h	i	j
K	l	m	n	o	p	q	r	s	t
U	v	w	x	y	z	A	B	C	D
E	F	G	H	I	J	K	L	M	N
O	P	Q	R	S	T	U	V	W	X
Y	Z	!	“	#	%	&	‘	(	)
*	+	,	-	.	/	:	;	<	=
>	?	@	$	Sp	_	^	{	}	\
[	~	]	|						